MEDICAL LIBRARY
AUG 23 1960

Volume 20 AUGUST 1960 Number 8

DISEASES OF THE NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

CONTENTS

PSYCHIATRIC TREATMENT OF INSTITUTIONALIZED DELINQUENT ADOLESCENT GIRLS 227
Ralph M. Patterson, M.D.

EVALUATION OF MODERN PSYCHIATRIC THERAPEUTIC MEASURES 233
Irving J. Sands, M.D.

L.S.D. 25 AS AN AID IN PSYCHOTHERAPY 241
Anthony K. Busch, M.D., and Warren C. Johnson, M.D.

SOCIAL FACTORS IN HEALTH 244
Harry Estill Moore, Ph.D.

NEUROLOGICAL CLINICAL PATHOLOGICAL CONFERENCE 247

SANITARIA

ASSOCIATE EDITORS

A. E. Bennett, M.D. ..... Berkeley, California
Francis J. Braceland, M.D. ..... Rochester, Minn.
Franklin G. Ebaugh, M.D. ..... Denver, Colorado
Temple Fay, M.D. ..... Philadelphia, Pennsylvania
Milton H. Erickson, M.D. ..... Phoenix, Arizona
Hamilton Ford, M.D. ..... Galveston, Texas
Walter Freeman, M.D. ..... Washington, D.C.
George N. Hardin, M.D. ..... Columbus, Ohio
A. Hastings, M.D. ..... Houston, Texas
Louis J. Karnosh, M.D. ..... Cleveland, Ohio
Frank H. Krusen, M.D. ..... Nashville, Tennessee
Wm. Malamud, M.D. ..... Boston, Mass.
Karl A. Menninger, M.D. ..... Topeka, Kansas
Hans H. Reese, M.D. ..... Madison, Wisconsin
S. Bernard Wortis, M.D. ..... New York, N.Y.

YEARLY SUBSCRIPTION $4.00
SINGLE COPIES 35 Cents
FOREIGN SUBSCRIPTIONS $4.50

Elias H. Harris, M.D.
Galveston, Texas
Editor-in-Chief

George Riegel, B.S., LL.B.
Chicago, Illinois
Managing Editor

THE RING SANATORIUM

Arlington Massachusetts

Eight miles from Boston at an elevation of 400 feet

For the study, care and treatment of functional and personality disorders.
All recognized psychiatric therapies are employed.
Cottage accommodations meet varied individual needs. Limited facilities for the continued care of progressive cases requiring medical, psychiatric or neurological supervision.

CHARLES E. WHITE, M.D., [illegible] BRENNER, M.D.
FRED E. LAWRENCE, M.D.
Associates

HARDING SANITARIUM

WORTHINGTON, OHIO

For Nervous and Mental Disorders

NINE MILES NORTH OF STATE HOUSE — COLUMBUS

HARRISON S. EVANS, M.D., Medical Director
GEORGE T. HARDING, M.D., President of Board
CHARLES L. ANDERSON, M.D., Clinical Director

E. HAROLD CAVINESS, M.D. THEODORE J. LUKENS, M.D.
J. [illegible] FRANEY, M.D. EMELIE M. GOULD, M.D.

CHARLES W. HARDING, M.D.

Telephone: Columbus FR. [illegible]

Compton Sanitarium

AND

Las Campanas Hospital

COMPTON, CALIFORNIA
(Near Los Angeles)

Compton Sanitarium is a private psychiatric hospital with 120 beds. Treatment is given psychotherapy by a staff of resident psychiatrists. Other treatment procedures are daily evaluated and administered. Careful records are maintained. There are psychiatrically trained graduate nurses; student nurses through affiliation; nursing attendants; dietitian; occupational therapist; recreational therapist; hydrotherapist; warehouse. Las Campanas Hospital (40 beds) provides adjunct general hospital facilities. Compton Sanitarium and Las Campanas Hospital are approved by the American College of Surgeons.

C. CRESSWELL BURNS, M.D., *Medical Director.*

BEVERLY HILLS CLINIC and SANITARIUM

For the Study and Treatment of Nervous and Mental Diseases

[illegible] R.O. WESTMORELAND DALLAS 11, TEXAS

This institution is a psychopathic hospital with a home-like environment and is equipped to study psychiatric and neurological cases in a most scientific manner by means of psychotherapy, occupational therapy, recreational therapy, and physiotherapy, including insulin and electroshock treatments as well as neurosurgery. There is a trained psychologist on staff as well as a trained social worker. An electroencephalographic instrument is available.

ARTHUR J. SCHWENKENBERG, M.D. JOSEPH L. KNAPP, M.D.
Medical Director Associate Psychiatrist and Clinical Director

[illegible] C. BOSWELL, JR., M.D.
Associate Psychiatrist

STEPHEN [illegible]SZ, M.D.

ARCHIBALD E. FOLEY, M.D.
Senior Resident Psychiatrist

ROBERT E. WINN, M.D.
Senior Neuropsychiatrists

VOL. XI AUGUST 1950 No. 8

Published monthly by
PHYSICIANS POSTGRADUATE PRESS
277 Broadway, New York 7, New York

EDITORIAL OFFICES
UNIVERSITY OF TEXAS SCHOOL OF MEDICINE
800 Avenue B., Galveston, Texas

Entered as second-class matter at the Post Office at New York, N. Y.

DISEASES of the NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Psychiatric Treatment of Institutionalized Delinquent Adolescent Girls

RALPH M. PATTERSON, M.D.*
Ann Arbor, Michigan

The present emphasis on group therapy, the opportunity to conduct an investigation, and the writer's basic interest in juvenile delinquency, were the three forces which in combination motivated the writing of this paper. The need for more extensive psychiatric assistance was impressed upon the investigator while acting as consulting psychiatrist at a school for delinquent girls, and when the opportunity developed to spend three days weekly at the school it was welcomed with enthusiasm. The Girls' Training School at Adrian, Michigan, at which the work was carried out, is a State Institution operated upon the Cottage Plan, housing 275 to 325 girls of the ages of 12 to 18. All are wards of the school by reason of commitment from the Juvenile Courts of the State of Michigan. The purpose of the investigation was to determine, if possible, what avenues of therapy might be advantageous, and accordingly what aspects of a therapeutic program should be encouraged and emphasized. The study was facilitated by the whole-hearted support of the administrative personnel of the school. Every possible privilege was extended and no restraining regulations were permitted to interfere with the study.

The problems which confront the school can be more readily appreciated by a description of the typical ward. The average girl at the time of admission would be fourteen to fifteen years of age, with a social background characterized by one to several generations of maladjusted individuals. The social and economic level of the class from which she came would be extraordinarily low, with the house itself a tent, a shack with or without a floor, or cramped quarters in some slum district. The home, that is the family, would have been poorly integrated, fluid in make-up with changing parents, foster-parents, step-parents, boarding parents, or no parents. Community living, or identification with any communal group, would have been poor, due to the instability of residence and history of frequent moves from state to state, city to city, or within a city. The girl herself would present a history of aggressive delinquent behavior, such as truancy, stealing, and almost invariably sex delinquency. She would have had the varied experiences of detention homes, boarding homes, and frequently various private institutions before commitment to the Girls' Training School.

In an institution housing a large number of girls of this type, with control and financing in the hands of the State Welfare Department, there is no room for expensive idealism. The approach to the problems of treatment must be therefore practical and concrete. With this in mind, the investigator decided upon three avenues of study—

*Professor of Psychiatry University of Michigan School of Medicine; consulting Psychiatrist, Girls' Training School, Adrian, Michigan.

group therapy, drama therapy as a modified form of group therapy, and brief individual treatment.

The selection of the girls to be used for the study was carried out by teachers, social workers, and psychologists. No restrictions were suggested in regard to age, intelligence, racial derivation, or type of delinquency. The only suggestion made in regard to selection was that those to participate in the group therapy be verbal individuals and those for the drama therapy class non-verbal. The candidates for individual therapy were picked at random by the investigator in the course of routine consultation interviews.

At the first meeting of the candidates for group therapy, the procedures to be followed and the purpose of the experiment was outlined and the invitation extended to continue in the class. It was expected that in keeping with the usual negativism of such girls, a third, more or less, would decline the invitation. To the writer's surprise, the interest was unanimous and so the first obstacle, that of too large a class, presented itself. As these girls are extraordinarily sensitive, it was difficult to reduce the number and so a class of fifteen was organized and the average attendance throughout the period of study was thirteen to fourteen. The meetings were held in the library with the girls sitting about in a circle without restriction in regard to a designated seat and with the freedom of sub-grouping that spontaneously developed but varied from time to time. The leader placed himself unobtrusively in some segment of the circle, at times beside a girl that was at the moment inclined to promote off-side distracting activities, or beside some girl that might benefit by the ego inflation felt when seated beside the leader. The aim was to lead and to control, without dominating, imposing upon, or restraining the spontaneous expressions of the girls. One might suspect that a man, seated with a group of girls from an institution wherein men were in general taboo, would have difficulty playing a background role, but the follow-up interviews indicated that the goal was successfully achieved and that the leader was "scarcely noticed," during the animated discussions which took place.

In the first discussion meeting, the leader suggested that they start off by talking about step-fathers. Knowing that undoubtedly many of the girls would have step-fathers and that all of them had had difficulties with step-parents, parents, or substitute parents, it was thought that this would promote discussion and yet not produce an explosion. The selection proved to be a very fortunate one for almost immediately several girls began talking about step-fathers and before the termination of the first hour, the group was well-knit and achieved a group identification by the mutual feeling of having had difficulty with parents. It was a simple matter to go from step-father to step-mother, to parents, to parent substitutes, and to the numerous other topics discussed. At the beginning of each hour, the therapist would pick up some thread of the discussion of the previous hour, some item that had been unfinished and appeared to be of interest and to have an emotional charge. The therapist did not answer questions, give interpretations, nor did he moralize in any way, but used his influence to keep down the number of girls talking at once, and to occasionally suppress personal comments about girls not of the group, or about officers of the school. The suppression of the discussion of such items that were considered dangerous and not of vital emotional importance was carried out in a soft manner, using suggestion and distraction, rather than command or prohibition.

To better illustrate the conduct of the meeting, let me describe Elinor's comments as she dominated very nearly a whole hour. Elinor held the attention of the group in a remarkable fashion as she began talking of her father, the patriarchal atmosphere of her Bulgarian-American home, the favoritism extended to the boys of the family in contrast to that given to girls, and particularly the beating that she received. "I got home later than I should and I thought I would come in the cellar window like my brother had done. I opened the window and was reaching down to put my foot on a cot that always sat below the window when I

stepped on something soft. It was my father. He had come down into the basement to lie down after an argument with my mother. Boy, was he mad! He grabbed a coal shovel that was there and started beating me on the back and then when my brother came down the stairs he turned the shovel over to him and my brother kept up the beating." It is of interest to note that the allegedly patriarchal continental culture is frequently a fiction and that in this particular home, the father had been bested by the mother and had retreated to the basement, and that this girl very unfortunately found herself the target of all the hostility which her father had been unable to vent upon his wife.

Other topics besides those mentioned which brought forth much spontaneous and lively discussion were siblings, grand-parents, drinking, whippings, mudslinging, policemen, the importance of clothes, and "crushing." "Crushing" is a term which has a rather distinctive meaning amongst the girls and the personnel of the school. It refers to the intense and sexually charged friendships which develop between the girls at the school, particularly between the girl of one cottage and that of another, and especially between a white and colored girl. As most of the girls have had hetero-sexual experiences, these friendships are quite obviously substitutes and genuinely homosexual girls are very uncommon, there being but one or two present at one time on the campus. As "crushing" is a forbidden activity, it becomes immediately desirable. The defiance of authority and the secretiveness of the note-writing, and the passing of handkerchiefs, etc., becomes disproportionately romantic. It was of interest to note that some of the girls were quite unaware of the sexual charge present in the friendship and that they were naively unaware of the fact that they had substituted in fantasy a girl for some former boy friend. One colored girl described in dramatic fashion the observations she had made as a singer in bawdy taverns, where she had observed fights and near-knifings over homosexual friendships. Another colored girl clarified the tendency of the white girl to become attached to the colored girls when she commented "the white girl thinks of the colored girl as having the body of a boy." Strange to say this spontaneous and accurate analysis of the phenomenon was somewhat shocking to a few of the white girls present, though they had been quite active in such friendships.

There appeared to be a cyclic character to some of the phenomena that characterized the meetings. Over a period of several hours, one might observe a gradual build-up in the emotional charge of the meeting and an increase in the noisiness and the number who wanted to talk at once, following which there would be a spontaneous self-restraint and the meetings would become again very orderly, only to build up once more to a disturbing intensity. Since it appeared that this might be avoided by dividing the group in two, this was suggested, but immediately rejected by the group, undoubtedly because of the group feeling and mutual identification that had developed. Another interesting observation which promoted eventually the discussion about "mud-slinging" was the frequent build-up in the tendency to make sadistic comments about others. One girl finally came out with the question, "Why do people always want to hurt each other?" This tendency was self-terminating, as was also the inclination to talk about confidential things outside of the class. The girls themselves promoted the idea of maintaining a confidential atmosphere and "tore into" anyone who violated this self-imposed code. On one occasion, they decided to point out to a specific girl all of her faults and the reason she had difficulty getting others to like her, and planned at that time to continue doing this with other girls, but recognized that this was dangerous and not beneficial and promptly dropped this approach.

It might be of interest to describe the changes that took place in two of the girls in the period of four months in which they met three times weekly. Rose was a girl whose home had been broken by the death of her mother when she was a small child. She was left with friends in Porto Rico and her father returned to the United States. Rose lived as best she could here and there, without supervision and without the inter-

est of any particular person. At nine years of age she was supporting herself as a homeless waif, living in rural parts of the island usually without shelter. Eventually she was brought to the home of her father and stepmother in Detroit, Michigan, but at the age of twelve was totally unable to adapt herself to the rigid, fanatically religious atmosphere of the home, or the exciting life of a semi-slum district in the city. Having lived in Puerto Rico, the fact that her father was white and her step-mother colored, was of no importance to her for she was quite obviously without any racial prejudice. Because of her starved ego, she was in the early sessions most vociferous and demanding of attention. This inclination to dominate the meetings gradually subsided so that during the last several weeks, she was able to listen, to give attention to others, to receive other viewpoints, and was quite free from the compulsion to place herself in the foreground. This represented a striking improvement in her adaptability in interpersonal relations. This was accompanied subjectively by a feeling of ego strength.

Mary W., a colored girl, came from a home which was characterized by a usually absent, non-contributory, alcoholic father and a psychotic mother. She had reacted to this situation by becoming a ribald tavern singer, and prior to admission had seen or experienced practically every type of activity that could take place in and around these disreputable taverns. Her superiority in concept thinking and her ability to express herself clearly and dramatically made her quickly one of the leaders in the group discussion. During the several months, she changed from a defensive, boastful individual to a much more serious person, who was inclined to consider her behavior in the light of the future and in the relationship to other individuals. She remained throughout a leader and her own change had a decidedly beneficial influence on the other members.

Approximately a third of the group were colored and one could not help but notice the superior ability of the colored girls to express themselves clearly and to grasp factors in interpersonal relationships more readily than the white girls. The investigator gained the impression that amongst these girls concept thinking was superior, perhaps because of the struggles which they had been through, and their frequently advanced social maturity.

After the sessions were terminated, each girl was interviewed in order to obtain her subjective reactions to the experience. All thought that they had benefited, even those few who admitted that they entered the class with the sole aim of escaping some other activity. Each emphasized her improvement in interpersonal relations and ability to recognize that differences of opinion could exist, could be understood, and justified. All emphasized that the discussions about parents and step-parents, and about "crushing" had been of the greatest value. Objectively, the group as a whole demonstrated a gradual decrease in belligerency during the four months' period, and a greater appreciation of the feelings and thoughts of others. An improved understanding of social relationships and a growing capacity to think of themselves as a part of a social group, and as a part of a community, had developed with a corresponding decrease in the inclination of the girl to think of herself as an isolated individual opposed to the community or the group.

The drama therapy group was made up of ten girls selected by the teachers and social workers as non-verbal individuals. This characteristic was not universal for in the discussions which followed the dramatization of scenes, two of the girls proved to be quite verbal. The conduct of the sessions was something as follows: The leader suggested a pertinent theme or problem and accepted volunteers, or invited certain girls to act specific roles. After struggling through a scene these roles were shifted about and the drama re-enacted. The therapist took quite an active role, made suggestions to the girls to stimulate their productivity, and frequently played some particular part such as the kind or cruel father, the kind or punitive judge, or a prospective boarding father, the purpose being to draw the girls into a more active participation. After the dramatization of the scene, the

members of the group were persuaded to discuss what had been said, what should have been said, or how they would have met the particular situation. The activities were spontaneous and without previous preparation, other than to name the topic and invite certain girls to accept specific assignments for the next session.

The first dramatization was that of the placement of the girl in a boarding home. This theme was selected as some of the girls expected to leave the school within a few months and were vitally concerned with placement and how they would meet the difficulties of adjustment in the community. The characters were the girl being placed, a social worker, the prospective boarding father and boarding mother. The discussion which followed brought out the concern which the girls felt about how much information the social worker should give boarding parents, whether or not they should emphasize the girls' past behavior or the good qualities, and how a girl would like to be received by boarding parents. One of the girls about to be placed was asked to play the role of the social worker and it was suggested that she bring her report of an investigation of a prospective boarding home to the next session and present it to the Judge of the Juvenile Court. To the surprise of the leader she prepared an extensive report which depicted a home of wealth, luxury, high social standing, and which emphasized college education. The acting and the discussion which followed revealed quite clearly to her that she had described a home which gratified her wishful thinking, a home which possessed the type of culture she wished to join, but yet one in which it would be impossible for her to adjust. Scenes depicting various activities of the Juvenile Court, the truant officer, and parents offered these girls the most stimulation and the greatest opportunity for expression. In playing any role of authority, the girls were inclined to be punitive, and then in the discussion to criticize the punitive approach of the problem as being a method devoid of satisfactory results. In playing the role of the parent, who had just learned of a daughter's sex delinquency and who was confronting the daughter with that information, the girls again found themselves punitive and quite at a loss to meet the situation. They quickly recognized that in acting out the role of a parent or judge, they behaved in accordance with their own experiences, but quickly condemned this technique.

The girls were all very serious and active in their participation in the group work. It was apparent that without the audio-visual experience in the drama, they would have been unable to discuss problems related to themselves. Group discussions alone as conducted by the previously described group would have been completely unproductive and stale with this non-verbal class. The enactment of one or another role in a scene, or the observation of some other girl's characterization of this role, enabled them to become objective and with assistance to verbalize regarding those problems which concerned themselves.

Over a series of meetings, the sense of reality in the sessions was augmented by giving the delinquent character a specific name, "Genevieve." As in a serial novel, Genevieve was the problem girl who had the various disagreeable experiences and was followed through various court, home, and school situations. The girls identified themselves very readily with Genevieve and by this trick of projecting themselves into the character were much freer in discussing their own problems. Before the sessions were terminated, most of the girls were able to drop this projection mechanism and talk directly about themselves, rather than about Genevieve.

Subsequent to the termination of the sessions, each girl was personally interviewed in order to determine the effect of the experience. The comments were quite different from those received from the members o f the group therapy class in that rather than emphasizing an improvement in interpersonal relations, these girls emphasized their improved ability to express themselves verbally, particularly in the presence of others. They emphasized secondarily an improved ability to get along with other people and an improved understanding of girl-parent relationships. Some mentioned

a gain in understanding of the function of the court and the social worker. The objective observations were in keeping with the comments by the girls. One girl of borderline intelligence, deficient in concept thinking, appeared to have gained absolutely nothing from the meetings, but all the others appeared to have received some benefit.

Individual therapy was carried on with a number of girls during this same period of time, with interviews three times weekly for ten to fifteen hours. For this program, the girls were chosen from those seen in consultation. An attempt was made to select girls that were maladjusted or delinquent because of the influence of one or another neurotic mechanism. It should be added that the typical inmate of the school is not neurotic, but hostile, aggressive, and delinquent in response to a very real, very disagreeable home or community situation. In the brief form of psychotherapy practiced, the usual primary purpose was to develop an insight into the aggressive, hostile behavior. This approach had the aim of developing an understanding on the part of the girl of her previously repressed, or diverted hostilities. Characteristically, this type of delinquent was defensive of the parent and hostile toward all other adults, particularly those in authority, or those of a different social level, and the immediate goal of therapy was to channel this hostile feeling toward its true target and dissipate it if possible in order to permit an adjustment in the community and with substitute parents.

Discussion

Although the investigation was begun with the hope on the part of the therapist that he would be able to establish some comparative evaluation between group therapy, drama therapy, and individual therapy, the absurdity of such a goal became quickly apparent. All of the girls under treatment were subject to the impact of the school program and the individualized interest of the various members of the personnel. Obviously the improvement observed during the several months of treatment might well have been largely the result of other experiences and it would have been erroneous to have ascribed this change as due solely to the therapeutic maneuvers of the psychiatrist. Furthermore the comparison of the results from group therapy and from individualized therapy is illogical in that the latter is personal and specific to a degree that makes comparison with the other techniques quite unscientific. There is no question in the mind of the investigator, but that group therapy is extremely valuable in improving a girl's adjustment to herself and others. It did frequently pave the way for later individual interviews concerning problems which could not properly be taken up in the group. Drama therapy was likewise beneficial and effective and as a result of the rapport established with the therapist, it also promoted individual interviews requested by the girls. These were contacts which never would have developed otherwise.

The investigator was concerned with the possibility of having group therapy or drama therapy conducted by other members of the personnel, but concluded that this would be hazardous. Drama therapy might well be carried out by a person with some training, but limited experience, since many of the scenes were depictions of very real social situations. However, it would be very difficult to find amongst the personnel of the usual corrective school an individual capable of conducting group therapy sessions where the permissive character of the meetings must be maintained and emotional involvement on the part of the leader avoided. Meetings need to be kept especially free of any critical or moralistic interference.

In conclusion, let me state that group therapy conducted by an able individual has much to offer in a school for delinquent adolescent girls and that drama therapy likewise can make a distinct contribution to the improved adjustment of the less verbal individuals, but that neither program is a substitute for individualized therapy. Despite the benefit to be received from such a program, it would be a grievous error to consider group therapy as a practical or economical substitute for individual therapy. The need for individual psychotherapy will continue unabated, in fact be advantageous and invited, when programs of group and drama therapy are introduced.

Evaluation of Modern Psychiatric Therapeutic Measures

(Practical Considerations in the Treatment of the Mentally Ill)

IRVING J. SANDS, M.D.
Brooklyn, N. Y.

The modern therapeutic assault on mental illness was spearheaded by the introduction by Sakel of insulin in the treatment of schizophrenia.[1] This was soon followed by the introduction of convulsive therapy by Meduna by means of metrazol[2] and by Cerletti and Bini by the employment of electricity.[3] This was climaxed by the use of lobotomy by Moniz.[4] The employment of these physical agents combined with the reawakened interest in psycho-therapy, especially narcotherapy and group psychotherapy, not only revolutionized the treatment of the psychoses but also changed the entire approach to the management of all other mentally ill people. While the neurological and psychiatric literature is full of accounts of these forms of treatment, other medical literature gives scant notice to the subject and the profession generally is quite confused regarding these various methods of therapy. Even neuropsychiatrists are often bewildered at the speed with which newer methods and their modifications are being introduced. Hence, an account of the basic principles involved in these newer forms of treatment and their application would seem opportune at this moment.

Insulin Shock Therapy

In 1936, insulin treatment for schizophrenia was introduced in this country.[5] The first reports were so favorable that they electrified the psychiatric world and many psychiatrists began to use the drug on their patients. The state hospitals soon began to employ it and in New York State insulin shock therapy was instituted at the Brooklyn State Hospital in January 1937. The initial dose of insulin consisted of 25 units being increased by 15 to 20 units daily until the shock dose was reached. Every patient received deep shock and the dose necessary to induce it varied with different patients. The patients were permitted to remain in deep phase of coma for a period ranging from two and a half to three and a half hours. At least 35 treatments were administered, the average being about 42; the average number of comas was 38 which was considered a full course of treatment. Every patient was carefully surveyed physically and psychiatrically until a definite diagnosis was established before insulin treatment was instituted. The results were so gratifying that in 1944 a temporary commission on state hospital problems was appointed to investigate this form of therapy.[6] In all, it surveyed 1,128 dementia praecox cases treated with insulin shock therapy between January 1, 1937 and June 30, 1942 at the Brooklyn State Hospital and compared the results of such treatment with those obtained in the usual custodial care of 876 dementia praecox cases who did not receive any form of shock treatment but were otherwise comparable as to significant factors to the insulin treated group. The control group were patients admitted to the Manhattan, Kings Park, Central Islip, Pilgrim, Creedmoor and Rockland State Hospitals. It was found that a larger number of the insulin treated patients were able to leave the hospital, as compared with those of the control group, the greatest difference being among the paranoid patients. There was also an average saving of three and a half months of hospitalization for each of the insulin treated patients who were discharged from the institution. It was also found that among those who were able to go home, there was a greater level of usefulness in the insulin treated cases than in the control group. The results of this survey established the validity of the method of treatment and its usefulness in the management of the schizophrenic patients. While the anticipated results were not fully realized, and many patients returned to the hospitals for further care and treatment, the fact re-

Read before the Section on Nervous and Mental Diseases at the Annual American Medical Association Convention at Atlantic City on June 10, 1949.

mained that insulin produced a definite remission in a sufficient number of patients to warrant its continued use.[7] Every well conducted psychiatric hospital is now equipped with an insulin unit for the adequate administration of this drug.

With further experience it soon became apparent that comas were not an indispensable prerequisite for obtaining a remission in these patients. Ambulatory insulin treatment administered in sub-shock doses was found to be useful in a large number of cases.[8,9,10] Moreover, a recent report in 300 consecutive psychotic cases proved that sub-coma insulin therapy was an effective method of treatment for a variety of psychiatric syndromes.[11] It was used not only in schizophrenia, but in manic depressive and paranoid conditions and involutional psychoses. It has been found very helpful in relieving anxiety and tension states, not only in psychotics but in psycho-neurotics, as well.[12] The use of insulin for sedative purposes had previously been found very effective.[13] It has been used in sub-coma doses even in patients' homes.[14]

Metrazol Convulsive Therapy

In 1936, there appeared in this country a publication by Meduna[2] in which he outlined the treatment of schizophrenia by convulsions induced by metrazol. He based his theory on observations made by Nyiro and Jablonsky in 1922 on epileptic patients that there existed a biologic antagonism between schizophrenia and epilepsy. He reported on 74 patients, of whom 39% were cured and 15% showed improvement by treatment with convulsive shock therapy through the medium of metrazol. This was soon employed in various hospitals in this country[15] and the psychiatric literature became filled with reports of marked improvement and often cures in various forms of psychoses,[16] but particularly in the manic depressive, depressive group, and in the involutional melancholias.[17] Further experience proved that convulsive shock therapy was relatively ineffectual in schizophrenia, but was extremely helpful in the cyclothymic and involutional disorders.[18] However, quite a large number of serious complications resulted from metrazol treatment, particularly in the nature of fractures of the bodies of the fourth to sixth thoracic vertebrae, fractures of scapulae, femur, humerus and pelvis.[19] Moreover, many of the patients developed marked fear reaction toward that treatment and many of them discontinued it. It was found that the severity of the muscle contraction resulted in these fractures.[20] This was remedied by the introduction of curare,[21] sodium amytal and sodium pentothal. Furthermore, putting the patient in a position where the spine would be hyperextended, minimized considerably the number of vertebral body fractures.[22]

Electro-convulsive Therapy

In 1938 Cerletti and Bini[4] introduced convulsive therapy by the employment of an electric current by means of a special apparatus. Because of its simplicity, the lack of fear on the part of the patient and the feasibility of the method, electro-convulsive therapy soon replaced metrazol in the treatment of the psychotic patient.[23] Not infrequently metrazol, and later electricity, were combined with insulin in the treatment of many refractory cases, and the combination of the two brought about cures or remissions where each therapeutic measure used independently failed to do so.[24] The convulsive shock therapy proved extremely valuable in involutional melancholia, in the depressed phase of manic depressive psychosis, often in the excited manic phase, and in many of the paranoid and catatonic schizophrenics. Because of the very simplicity of the method, extramural electro-shock therapy was soon instituted.[25] In fact, it has become a method used by many psychiatrists in their offices or in the patients' homes.[26] The avoidance of hospitalization, the continued contact with the family in a normal, healthy environment, the continuation of gainful occupation and the avoidance of the stigma attaching to psychiatric hospital residence, are the reasons given for the extramural convulsive treatment. At times immediate institution of electro-shock therapy is imperative but due to the lack of beds in private hospitals and the reluctance on the part of the family to send the patient to a state hospital, extramural treatment in the doctor's office or at the patient's home proves feasible and valuable. It must be

remembered that as yet the general hospital will not accept even mild psychiatric patients and, therefore, the use of the physician's office and the patient's home for the administration of convulsive shock therapy is justifiable.

Shock therapies have proven effective and their use is employed by every well-trained and experienced psychiatrist.[27] Despite the fact that there are some fifty theories offered to explain the rationale of shock therapy,[28] no one has offered a satisfactory explanation for the results obtained. We know that it works, but no one knows how it works. Everyone agrees that shock therapies work best in early cases. It has been repeatedly shown that the best results obtained with insulin in schizophrenia are in those patients who have been sick less than two years. This holds equally true with convulsive shock therapies when given early in the course of the disease. Despite an occasional dissident note[29] the shock therapies have produced remarkable results.[30] It is recognized that they do not prevent recurrences but they shorten the duration of every attack and they have minimized the danger of suicide. They have shortened hospital residences and have, therefore, made available more beds for other patients. Furthermore, the general morale of the hospital wards has improved. The patients are quieter, the nurses and attendants more interested and the physicians and the psychiatrists have been stimulated to further investigative therapy. Moreover the institution of extramural convulsive therapy and the use of sub-shock insulin in the treatment of many psychotics in some of the wards of general hospitals, as well as in the patients' homes, has afforded a good deal of encouragement to the mentally ill and to their families, and has put psychiatry on the same plane as the subacute or chronic somatic disorders.

Experience has taught how to avoid serious complications both in insulin as well as in convulsive shock therapy. There is considerable disagreement as to the need for curare[31,32] or sodium amytal[33] to prevent fractures, and many psychiatrists do not use them, but their use is certainly indicated in those cases where there has existed a previous vertebral fracture,[34] where there is a severe arthritis of the spine, or where the bones are brittle, such as in aged psychotic patients.[35] It must be emphasized that the complications in convulsive shock therapy are infrequent, in fact electric shock has been used effectively during pregnancy.[36]

Frontal Lobe Surgery

Despite the beneficial results obtained by the shock therapies in a large number of psychotic patients, there remains a group who are refractory to insulin, metrazol and electro-shock therapy even when used in combination. Of late, surgical measures have been instituted in the treatment of these refractory cases and the frontal lobes are the ones so attacked. Freeman and Watts[37] introduced in this country the method first devised by Moniz.[4] Essentially, it consists of an attempt to sever the fibres connecting the frontal lobes with the thalamus. This method has been described under various headings, such as frontal lobotomy, leucotomy, pre-frontal lobotomy, and lately, psycho-surgery. Basically, the method is one of cutting the white matter in the frontal lobes by means of an instrument introduced through burr holes in the skull. This closed method has resulted in a number of deaths. Furthermore, no matter how skillful the operator may be, he is working in a blind field and no one may tell precisely the extent of the damage to the frontal lobes caused by this procedure. However, the results have been quite striking in many instances. Approximately 20% of the patients are able to return to their homes and many of them resume gainful occupations. The success of this procedure is in a measure dependent upon the care and attention and rehabilitation that these patients receive in the environment to which they return. Re-education is an indispensable prerequisite in the ultimate succes of such operations.

Freeman has revised his method and he now employs the trans-orbital approach,[38] in which he introduces the instrument through the orbital plate or the frontal bones and severs the orbital part of the frontal lobes. However, a few surgeons use an open operation.[39] Recently, Penfield has

devised a method which he designates as gyrectomy;[40] in this procedure he does an open operation and removes areas 10 and 9 of the frontal lobes. Pool has introduced another method, which he designates as topectomy[41] and which is characterized by removal of the gray matter of the dorsal mesial surfaces of areas 10 and 9 of the frontal lobes. The last two methods are done in the usual surgical technique, in which bi-frontal osteoplastic craniotomies are carried out and the areas to be excised are treated in the usual neurosurgical way. The results of these surgical measures are still a subject of great discussion.[42] Many disturbed patients become much quieter, they gain weight and many of them are able to return to their families. Nevertheless, there are many who question the advisability of such operations because of the personality changes that result from them. However, if one considers that this operation is done only where all other forms of therapy have been tried and found wanting and that these patients have been relegated to a state of utter helplessness and hopelessness, and when a large number of operated patients are able to return to their homes and some of them are even able to assume certain responsibilties and take their place in their social environment, this operation is justifiable.

An ingenious method has been devised by Spiegel and Wycis, which is designated as thalamotomy.[43] By a special technique they are able to reach the dorsal mesial nuclei of the thalamus and destroy them, thus causing as minimal an injury to the brain substance as possible and yet are able to sever the connection between the frontal lobes and the thalamus. While this method is technically a difficult one, it holds considerable promise.

Therapeutic Indications

In the practical application of the methods thus described, one must take into consideration the nature of the patient's illness, his social and economic status, the age and the home situation. Given a case of schizophrenia, the patient should immediately be sent to a psychiatric hospital and insulin therapy instituted. In involutional melancholia, electric shock therapy is almost a specific form of treatment. If the home situation is such that the family is cooperative and helpful and is able to furnish nursing care so that the patient would never be left alone, the treatment may be given at home or in the doctor's office, if hospitalization is not feasible. However, should there be any doubt as to the home situation, the patient must be sent to a psychiatric hospital for care and treatment. The same holds true in the manic depressive types of psychoses. Manic patients must be sent to a hospital. Mild depressions may be managed at home. However, when the danger of suicide is apparent, institutional care is imperative. Frontal lobe surgery should be used only in those cases which have resisted all other forms of therapy.

The general hospital could be of tremendous help in the therapeutic attack on mental illness if it had a psychiatric service with facilities for the administration of the various forms of convulsive therapy. Its outpatient department could well be utilized for the care of a large number of those psychotics who do not require institutional care. Unfortunately, very few hospital administrators are willing to have such services in their general hospitals.

The Psychoneuroses

The shock therapies have been used in the treatment of the neuroses.[44] The convulsive therapies have been found not only wanting[45] but often aggravating in the anxiety states and in the hysterias. Compulsive-obsessional states have not been relieved by electro-convulsive therapy, though the depressive aspects have been removed by such treatments. Nevertheless, whenever the obsessive-compulsive patient becomes socially handicapped, functionally incapacitated and also homebound, electro-shock therapy may be given; if such treatment is ineffective, and the distressing symptoms persist, frontal lobe surgery may be employed. In the reactive depressions, convulsive shock therapy may be used if intensive psychotherapy has proven inadequate in a given case. In the psychoneuroses that are accompanied by marked anxiety and tension states, subshock insulin therapy has been found of considerable value. In general, it may be said without prejudice, that the shock therapies

are contraindicated in the treatment of the neuroses, and that psychotherapy, in the hands of well trained and experienced psychiatrists is still the method of choice in the management of these disorders.

Psychotherapy

It has been repeatedly pointed out by all who employ the shock therapies, and by those who use frontal lobe surgery in the treatment of the mentally ill, that the best results are obtained in those patients who have received in addition intensive psychotherapy. Psychotherapy is as old as mankind, and it may be applied to any method which is used by a person in influencing psychologically another person or a group of people in meeting life's problems realistically and effectively. There are many types of psychotherapies,[46] each employing some special technique,[47] but all using such devices as reassurance, suggestion, persuasion, reeducation, counselling, exhortation, and also hypnosis. To be effective and scientific, psychotherapy must be based on dynamic psychology, must offer a constructive theory of the structure and function of the psyche, and must explain psychopathological manifestations on dynamic principles.

Psychoanalysis, as discovered and outlined by Freud,[48] places psychotherapy on a scientific basis. The structure of the human psyche is developed in infancy and childhood. It consists of 1) the Id, or the reservoir of primitive, aggressive, erotic and instinctual impulses, 2) the Ego, or the executive or integrating part of the psyche, and 3) the Super-Ego, or conscience, which embodies the parental training and influences, and really represents the moral and ethical code of a given culture and society. The Ego is in contact with the Id and with the Super-Ego. It senses the inner needs and urges of the individual as they arise in the Id, and explores reality situations and weighs the advisability of permitting free expression of these instinctual impulses at any given situation. If free expression is inadvisable, by reason of certain prohibitions that may cause harm and danger to the individual, the Ego either modifies the method of expression of these instincts, or represses them in the unconscious. The unconscious is the repository of repressed instincts, impulses, forgotten memories and their effects. Psychoanalysis recognizes that good heredity, reasonable and adequate parental training, and reality situations that are conducive to satisfying gratification of instinctual drives in a manner acceptable by the society in which the individual functions, are indispensable prerequisites for normal mental health. Three factors contribute to neurotic or psychotic behavior. They are: 1) Heredity. A person born with poor equipment, such as bad heredity, or has been handicapped by serious disease or defects in the brain, may become mentally ill when faced with situations in reality that require adequate management. 2) Early experiences in life. Psychoanalysis has stressed the importance of parental attitudes and influences on the growing child. Repeated traumatic experiences caused by menacing parental attitudes or intimidating emotional situations, have been regarded as the chief cause of psychoneurotic behavior. The primitive and aggressive impulses, when attempting to find adequate expression, may be unsuccessfully handled by the infantile Ego, and are but partially repressed. They then seek expression along devious lines, and defense mechanisms are formed to prevent their full expression. These defensive mechanisms comprise the different symptoms of the neuroses and also of many of the psychoses. 3) Current difficulty and terrifying experiences. Reality situations that are frustrating, thwarting, and often terrorizing, may cause a neurosis. This has been aptly proven in traumatic psychic experiences in the last war. The war neuroses have resulted from terrifying experiences that were but unsuccessfully repressed in the unconscious and which cause the well known symptoms.

A faltering Ego, one that is faced with any of the three conditions mentioned, is unable to adapt the individual to the reality situation and a neurosis or a psychosis may develop. The concept of repression forms the central dynamic factor of the school of dynamic psychology. Repressed instincts and impulses, in the presence of a weakened Ego, may find expression along pathways that comprise the symptomatology of the neuroses. The neurotic individual is unaware of the impulses that try to come to

the surface; he is overwhelmed by his symptoms. Psychoanalytic therapy, by the prowess of free association, brings these repressed undesirable instincts and impulses into the field of awareness. In the physician-patient relationship, the patient experiences the same hostile and tender feeling which he had felt towards his parents and this phenomenon is called transference. Occasionally, one employs some narcotic, such as sodium amytal or sodium penthotal, and enables the patient to relive the past traumatizing emotional experiences and give free expression in his reaction to these terrifying experiences. This has been extensively and effectively used in treating the acute war neuroses and many of the acute psychotic reactions.

Psychoanalysis offers an effective psychotherapy, based upon a dynamic psychology. Moreover, it offers an understandable explanation of many of the psychotic symptoms;[49] it presents an intelligent explanation of the language of the psychotics.[50] While complete psychoanalysis may be employed in but a limited number of patients, the psychoanalytically oriented psychiatrist may be a more efficient therapist when using other psychotherapeutic measures. The school of psychobiology formulated by Adolph Meyer, stresses the all embracing study of the patient in his totality. It makes an exhaustive study of the patient's past and present experiences, and places the therapist in the position of teacher, educator and physician. It has many followers. Several of Freud's former associates have branched off and have formed systems of therapies of their own. Thus Adler formed a school of individual psychology, in which he stressed the feelings of inferiority and the drive for power; Jung emphasized symbolisms and religious beliefs, explained mental disorders as regressions to a collective unconscious and racial heritage; while Karen Horney placed emphasis on current cultural conflicts as the source of behavior disturbances. The Freudian psychoanalytic school has grown and has gained recognition in many of the better medical schools, while the dissident schools of psychoanalysis have become extinct with the passing of their leaders.

Group psychotherapy,[51] in which a number of patients may be treated at one time, has gained recognition from most psychotherapists and is now employed in many psychiatric hospitals and clinics. The technique may be readily acquired. Its use is rapidly being extended to all psychiatric centers.

Psychiatric Hospitals

Most psychotic patients are treated in psychiatric hospitals. Because of the chronicity of the illness and the financial burden it imposes upon the patients and their relatives, the majority of the patients are treated in state financed institutions, the state hospitals. The type of care and treatment given to the patients varies in different states and depends upon the available resources and upon the interest shown by the state administration. There are many state hospitals that afford most scientific care and treatment and many psychiatrists working in these hospitals have contributed materially to psychiatric progress. However, there are many institutions where the care and treatment are only of a custodian nature. A recent survey revealed that most state hospitals are understaffed, overcrowded and ill-equipped.[52] The admirable programs in Veterans Administration hospitals have attracted many psychiatrists, nurses and social service workers who might have come to the state hospitals. The postwar inflation has forced postponement of programs for expansion and increase in facilities and has neutralized the effects of increased budgets because of increased costs.

The hospital population is ever increasing and a serious problem is presented by the growing numbers of arteriosclerotic and senile patients. The psychotics are politically negligible and their friends and relatives are often ashamed, usually frightened and generally disorganized. The public must be awakened to its responsibilities to the mentally ill and this may best be accomplished by the organization of a national psychiatric association similar to the American Cancer Society. There is a crying need for a comprehensive plan for reorganization of the entire state hospital system, for the modernization of its buildings and equipment,

and for expansion of professional staffs. Moreover, a program for education must be included in such a plan.

The Psychotherapists

The psychotherapist must be a physician well grounded in the basic principles of dynamic psychology, and must have had training in neuroanatomy, neuropathology and clinical neurology. He must possess integrity, objectivity and a deep interest in human beings. He must be free from personal conflict, anxieties and bias. This may be best accomplished by undergoing a personal analysis as is demanded by the Freudian School of Psychoanalysis from each applicant for instruction in psychoanalysis. The young psychiatrist must have experience in the treatment of the patients in the various psychiatric hospitals and should acquire a working knowledge of the various methods of administration of the different forms of shock therapy. He must take advantage of the opportunities afforded at different institutions in keeping abreast with the progress made in the field of psychiatry. Good character as well as emotional maturity and stability are required of the psychotherapist as well as intelligence, training and experience.

The Incentive to Get Well

There are patients who react satisfactorily to hospital treatment but who relapse as soon as arrangements are made for their return to their homes. Generally, these are middle-aged patients often in their first admissions. In analysing their psychiatric episodes one is impressed with their atypical nature and with the presence of neurotic symptoms. These patients seem to lack an incentive to get well. This may be a manifestation of severe masochism and a part of their mental illness. However, an analysis of environmental situations will disclose some intense psychic trauma such as the loss of a close and dear one, the loss of a life's savings, serious disappointment in children, etc. These patients use the hospital as an asylum from situations that are thwarting and disappointing, and they seem to regress to an infantile pattern of behavior and lean upon their physicians as father surrogates. In this particular group of patients it is imperative to enlist the aid of social service workers and the members of their immediate families so that the environment might be manipulated in a manner that might prove more satisfying to the patients.

Summary

The shock therapies induced by hypoglycemia, by insulin, or convulsions induced by metrazol or electricity, have revolutionized the treatment of the psychoses and have been used also in the management of some types of psychoneuroses. Each form of therapy and its therapeutic indications are briefly discussed and outlined. The different forms of frontal lobe surgery are mentioned, and their indications in the chronic and incurable types of mental diseases, are analyzed. The importance and nature of psychotherapy in cooperation with these newer methods are also presented. The responsibility of the general hospital as an aid to the psychiatric hospital in the treatment of the mentally sick is stressed. The duties and responsibilities of the psychotherapist to the mentally ill are analysed and discussed.

REFERENCES

1. Sakel, M.: The Methodical Use of Hypoglycemia in the Treatment of Psychoses. *Am. J. Psychiat.* 94:111 (Jan.) 1937.
2. Meduna, L.: New Methods of Medical Treatment of Schizophrenia. *Arch. Neurol. & Psychiat.*, 35:361 (Feb.) 1936.
3. Cerletti, U., and Bini, L.: Electroshock Treatment. *Bull. Acad. Med. Rome.*, 64:36 (May) 1938.
4. Moniz, E.: "Tentative Operatoires dans le Traitment de certaines Psychoses." *Masson*, Paris, 1936.
5. Glueck, B.: The Hypoglycemic State in the Treatment of Schizophrenia. *J.A.M.A.*, 107:1029 (Sept. 26) 1936.
6. Insulin Shock Therapy: Study by the Temporary Commission on State Hospital Problems. 105 East 22nd St., N. Y. 10, N. Y.
7. Bond, E. D., and Shurley, J. T.: Insulin Therapy and Its Future. *Am. J. Psychiat.*, 103:338 (Nov.) 1946.
8. Polatin, P., *et al.*: Ambulatory Insulin Treatment of Mental Disorders. *N. Y. State J. Med.*, 40:843 (June 1) 1940.
9. Sargent, W.: Seven Years of Experience with Modified Insulin Treatment in Neuroses and Early Psychoses. *Am. J. Psychiat.*, 105:821 (May) 1949.

10. Sullivan, D. J.: Insulin Subshock (Subcoma) Treatment of Psychoses and Psychoneuroses. *Arch. Neurol. & Psychiat.*, 59:184 (Feb.) 1948.
11. Tomlinson, J. P.: Subcoma Insulin Therapy: An Analysis of 300 Cases. *Psychiat. Quart.*, 22:609, (Oct.) 1948.
12. Hohman, L. M., and Kline, C. L.: Sub-Shock Insulin Therapy in Anxiety States and Anxiety Depressions. *Dis. Nerv. Syst.*, 7:293 (Oct.) 1946.
13. Rennie, T. A. C.: Use of Insulin as a Sedative Therapy-Control of Basic Anxiety in the Psychoses. *Arch. Neurol. & Psychiat.*, 50:697 (Dec.) 1943.
14. Cohen, N.: Treatment of Mental Illness at Home by Small Doses of Insulin. *New Eng. J. Med.*, 240:669 (April 28) 1949.
15. Meduna, L., and Friedman, E.: The Convulsive-Irritative Therapy of the Psychoses. *J.A.M.A.*, 112:501 (Feb. 11) 1939.
16. Beckenstein, N.: Results of Metrazol Therapy in Schizophrenia. *Psychiat. Quart.*, 13:106 (Jan.) 1939.
17. Zeifert, M.: Metrazol Therapy in Manic-Depressive and Involutional Psychoses. *Psychiat. Quart.*, 13:498 (June) 1939.
18. Bianchi, J. A., and Chiarello, C. J.: Shock Therapy in the Involutional and Manic-Depressive Psychoses. *Psychiat. Quart.*, 18:118 (Jan.) 1944.
19. Polatin, P., et al: Vertebral Fractures Produced by Metrazol Induced Convulsions. *J.A.M.A.*, 112:1684 (April 24) 1939.
20. O. Carp, L.: Fractures and Dislocations by Muscular Violence Complicating Convulsions Induced by Metrazol for Schizophrenia. *Ann. Surg.* 110:107 (July) 1939.
21. Bennett, A. E.: Curare: A Preventitive of Traumatic Complications in Convulsive Shock Therapy. *Am. J. Psychiat.*, 97:1040 (March) 1941.
22. Haines, H. H.: The Prevention of Major and Minor Complications in Metrazol Therapy; Modifications of Technique. *Psychiat. Quart.*, 18: 660 (Oct.) 1944.
23. Kalinowsky, L. B.: Electric Convulsive Therapy, with Emphasis on Importance of Adequate Treatment. *Arch. Neurol. & Psychiat.*, 50:652 (Dec.) 1943.
24. Niver, E. O., and Catlin, K. A.: Experiences with Mixed Insulin and Electric Convulsive Therapy. *Psychiat. Quart.*, 21:660 (Oct) 1947.
25. Wender, L., et al: Extramural Shock Therapy. *Am. J. Psychiat.*, 99:712 (March) 1943.
26. Fetterman, J. L.: Ambulatory Electro-Coma Therapy of Psychoses. *Dis. Nerv. Syst.*, 8:1 (Jan.) 1947.
27. Lewis, N. D. D.: What's About Shock Therapy? *Mental Hygiene*, 30:117 (April) 1946.
28. Gordon, H. L.: Fifty Shock Therapy Theories. *Military Surgeon*, 103:397 (Nov.) 1948.
29. Salzman, L.: An Evaluation of Shock Therapy. *Am. J. Psychiat.*, 103:669 (March) 1947.
30. Paster, S., and Holtzman, S. C.: A Study of 1000 Psychotic Veterans Treated with Insulin and Electric Shock. *Am. J. Psychiat.*, 105:811 (May) 1949.
31. Brody, M.: Modification of the Electro-Shock Convulsion by Sodium Pentothal and Curare. *J. Nerv. & Ment. Dis.*, 102:357 (Oct.) 1945.
32. Riggs, B. C., and Schlomer, G. M.: Hazards of Curarization Before Electroshock. *Dis. Nerv. Syst.*, 8:382 (Dec.) 1947.
33. Impastato, D. J., et al.: Modification of the Electrofit. *Am. J. Psychiat.*, 100:358 (Nov.) 1943.
34. Gysin, W. M., and Dumars, K. W.: Electro-Shock Therapy on Patients Complicated by Skeletal Pathology. *Dis. Nerv. Syst.*, 9:300 (Oct.) 1948.
35. Feldman, Fred, et al.: Electric Shock Therapy in Elderly Patients. *Arch. Neurol. & Psychiat.*, 56:158 (Aug.) 1946.
36. Dolan, D. I., and Huston, P. E.: Electric Shock During Pregnancy. *Psychiat. Quart.*, 22:413 (July) 1948.
37. Freeman, W., and Watts, J. W.: Psychosurgery During 1936-46. *Arch. Neurol. & Psychiat.*, 8: 417 (Oct.) 1947.
38. Freeman, W.: Transorbital Lobotomy. *Am. J. Psychiat.*, 105:734 (April) 1949.
39. Scarff, J. E., and Kalinowsky, L. B.: Prefrontal Lobotomy Under Direct Vision. *N. Y. State J. Med.*, 47:2662 (Dec. 15) 1947.
40. Penfield, W.: Bilateral Frontal Gyrectomy and Postoperative Intelligence. The Frontal Lobes. P. 519. *Williams and Wilkins Co.*, Baltimore, 1948.
41. Pool, J. L.: Topectomy-Surgical Indications and Results. *Bull. N. Y. Acad. Med.*, 25:335 (June) 1949.
42. Moore, B. E. et al.: "A Cooperative Clinical Study of Lobotomy." The Frontal Lobes. P. 769. *Williams & Wilkins Co.*, Baltimore, 1948.
43. Spiegel, E. A., and Wycis, T.: Stereoencephalotomy. *Proceed. Soc. Exper. Biol. & Med.*, 69:175, 1949
44. Hamilton, D. M.: The Use of Electric Shock Therapy in Psychoneurosis. *Am. J. Psychiat.*, 103:665 (March) 1947.
45. Kalinowsky, L. B., et al.: Electric Convulsive Therapy in the Psychoneuroses. *Arch. Neurol. & Psychiat.*, 52:498 (Dec.) 1944.
46. Knight, Robert P.: A Critique of the Present State of Psychotherapies. *Bull. N. Y. Acad. Med.*, 25:100 (Feb.) 1949.
47. Brill, A. A.: Psychotherapies I Encountered. *Psychiat. Quart.*, 21:575 (Oct.) 1947.
48. Alexander, F.: "Fundamentals of Psychoanalysis." *W. W. Norton Co.*, New York, 1948.
49. Hinsie, L.: "Understandable Psychiatry." *The Macmillan Co.*, N. Y., 1948.
50. Brill, A. A.: "Freud's Contribution to Psychiatry." *W. W. Norton Co.*, N. Y., 1944.
51 Terhune, W. B., and Dickerson, J. R.: Progress in Group Psychotherapy. *New Eng. J. Med.*, 239:854 (Dec. 2) 1948.
52. Deutsch, A.: "The Shame of the States." *Hartcourt, Brace & Co.*, N. Y., 1948.

L. S. D. 25 As an Aid in Psychotherapy

(Preliminary Report of a New Drug)

ANTHONY K. BUSCH, M.D.
WARREN C. JOHNSON, M.D.
St. Louis, Missouri

In the treatment of psychotic patients in a hospital for chronic states, it is frequently difficult to elicit information, within a reasonable length of time, to develop a useful formulation of the patient's basic conflicts. There are many things that have come to be helpful in getting this information, viz.: interviews during amytal or pentothal narcosis; interviews during insulin shock, or while recovering from electric shock; etc. The many failures with these present methods have kept us constantly looking for a better means.

Occasionally, it was observed that patients were able to verbalize the repressed components of their conflicts during a toxic delirium. This led us to consider various drugs that might induce a transitory delirious state. It was during this search that the Sandoz Company called to our attention and made available d-lysergic acid diethylamide (L.S.D. 25).[1]

This drug is a synthetic amide prepared from natural d-lysergic acid and diethylamide and belongs to the ergonovine (ergometrine) group.[2] It is very active in small oral doses. The solution (L.S.D. 25) contains only 20 gamma per cc. The average effective dose for women was 1.5 cc. or 30 gamma, and for men 2.0 cc., or 40 gamma. Patients became aware of drug activity in from one-half to one and one-half hours. Maximum effectiveness was observed in from two to two and one-half hours and persisted for as long as eight hours, though four hours appeared to be the usual length of action. Phenobarbital tends to neutralize the activity of L.S.D. 25.

It is the preliminary investigation of the action of this drug in twenty-nine patients which we wish to report. The effects are listed under two headings:—systemic and mental.

Systemic Effects:

The systemic effects in the order of their frequency were: gastric distress, nausea, and occasional vomiting; muscle irritability, developing into tremors and sometimes twitching; dizziness, dilation of the pupils, with occasional hallucinatory flashes of light; chilliness; increase in pulse rate; occasionally, headache; and in a few cases, periodic flushing of the skin.

No changes were observed in the blood picture, urine, N.P.N., or blood sugar when studied before and after the several doses each patient received. The blood pressure and temperature exhibited no consistent changes during medication.

Mental Effects:

The mental effects were those of excitation. The patients moved about more, showed greater interest, responded more readily to stimulation, talked more, and exhibited more emotion. With this increase in activity, there was a greater verbal expression of psychopathology. There were occasional short periods of confusion and disorientation, and occasional transitory visual hallucinations. Most of the patients showed some degree of euphoria.

Below, is a more detailed list of the most outstanding behavior symptoms of each of the patients while under the influence of L.S.D. 25:

From St. Louis State Hospital and Washington University Medical School, St. Louis, Missouri.

Patient	*Sex*	*Age*	*Diagnosis*	*Remarks*
1. M.A. Adm. 5/22/49	F.	44	Catatonic Schizophrenia	After medication—more activity, possibly more alert; mumbling and incoherent speech increased.
2. J.B. Adm. 9/21/36	F.	53	Paranoid Schizophrenia	Complained of feeling faint and dizzy and was more active than usual with 1 cc. More activity with 2 cc, and seemed elated; said medicine made her "feel good." Later was fearful and preoccupied.
3. E.B. Adm. 1/3/44	F.	53	Paranoid Schizophrenia	Became more active; talked faster, with increased flight of ideas; was elated, "felt good, as if drunk." Active hallucinations expressed. Spoke to people not present, etc.
4. S.B. Adm. 10/25/19	F.	57	Chronic Mania	With small dose, patient was seen to talk more rapidly and more emotionally than before. All doses over 1 cc. appeared to make patient more disturbed.
5. C.C. Adm. 6/29/48	F.	49	Schizophrenia, Other types, Catatonic and Hebephrenic	She seemed to be more irritable, but entered into more activity on the ward, and was occasionally hostile. Hallucinations about men in a fire truck.
6. M.F. Adm. 12/4/44	F.	41	Hebephrenic Schizophrenia	Patient talks more rapidly, and usually more coherently. More interest in ward activity—entering into games and O.T.
7. M.H. Adm. 10/15/45	F.	24	Schizophrenia Simple, dull normal intelligence	Patient usually mute and withdrawn. After medication, writes letters, and occasionally sings to herself. More alert.
8. A.H. Adm. 6/10/45	F.	46	Schizophrenia	Talks more rapidly, but frequently so fast it is not understandable. With a 3 cc. dose, was so uneasy that she was unable to play games in O.T. Had tremor of hand, unable to write.
9. C.H. Adm. 9/7/43	F.	37	Schizophrenia, Paranoid	Attempts were made to work puzzles and to write. Hallucinations increased, but coherent statements occasionally.
10. L.H. Adm. 12/20/30	F.	47	Schizophrenia, Paranoid	More talkative, more profane, expresses hallucinations following medication. More active, requires occasional wet sheet pack.
11. F.H. Adm. 11/19/45	F.	47	Schizophrenia Paranoid	Speech is increased, but becomes incoherent frequently. With lower doses, entered into ward activity and did drawing. Became quite disturbed when 3 cc. of L.S.D. 25 were given.
12. L.J. Adm. 11/24/41	F.	46	Paranoid State	Became sarcastic and active with medication.
13. M.M. Adm. 9/20/32	F.	72	Schizophrenia Paranoid	Increase in combative behavior. More active and profane. Speech was usually incoherent.
14. M.M. Adm. 10/10/46	F.	46	Schizophrenia Hebephrenic	More spontaneous and talkative; nausea on occasion.
15. C.P.	F.	38	Schizophrenia	Patient was noticeably more responsive. Speech often incoherent. Answers some questions coherently. More irritable.
16. E.J.	F.	40	Schizophrenia	No marked change in behavior. Speech coherent and increased, on occasion.
17. A.R. Adm. 11/5/45	F.	48	Manic-Depressive Manic Phase, Post-Lobotomy	Complained of nausea and headache. More noisy and combative if medication is given when disturbed.
18. H.W. Adm. 8/16/43	F.	49	Manic-Depressive	More talkative, and more irritable. More resistive, suspicious, active.
19. M.S. Adm. 5/19/47	F.	41	Schizophrenia, Catatonic and Paranoid Features	She became more talkative, more responsive and better able to express herself. Patient was more conscious of her difficulties and wanted to do something about it. Became over-active on several occasions, with larger doses.
20. S.P. Adm. 8/31/42	F.	42	Schizophrenia Paranoid	Patient became more expressive. Responded better to environment. She was more active and better able to discuss her problems.
21. D.L.	F.	32	Schizophrenia Catatonic and Paranoid Features	Following medication, patient was able to express her feelings; better able to act out her hostility in an acceptable manner. She could discuss her problems.

These twenty-one psychotic patients showed increases in activity. The manics, 4, 17, and 18, to such an extent that hydrotherapy was necessary for control. Four of the paranoid schizophrenics, 10, 11, 13, and 19, also required hydrotherapy. Despite this, we were impressed by the various attempts most of the patients made to establish some kind of interpersonal relationship with the personnel. This was especially prominent in patients 19, 20 and 21. In view of this, it was decided that the drug might be of value during psychotherapy. Eight patients undergoing psychotherapy were then chosen for a trial. Four were in-patients and four out-patients:

Patient	*Sex*	*Age*	*Diagnosis*	*Remarks*
22. V.P. Adm. 12/7/48	F.	37	Psychoneurosis, Mixed Type	Two Interviews with L.S.D. 25 showed a change in affect from usual flat to appropriate and even excessive (crying). She was able to recall her childhood vividly. She discussed her immediate problems. Response was much better than previous 36 interviews, two with the aid of amytal.
23. E.J. Adm. 2/21/49	F.	23	Schizophrenia Catatonic	Showed more feeling; talked more freely and easily; more insight into family situation; marked emotional tone. Dizzy immediately after administration.
24. V.Z. Adm. 12/7/48	F.	25	Schizophrenia Catatonic	Better able to talk about her early life. Showed some regressive behavior and seemed to re-live childhood experiences.
25. J.M. Adm. 6/7/49	F.	23	Schizophrenia Catatonic	Response to L.S.D. 25 was increased activity and interest in surroundings, as well as ability to discuss her problems, which was as good as, and probably better than, discussion under sodium amytal.
26. Z.T. (Out-Pt.)	F.	26	Psychoneurosis	Relived traumatic episodes of childhood.
27. E.H. (Out-Pt.)	F.	48	Psychoneurosis, Hysteria	Relived traumatic episodes of childhood. Previous amytal interviews had failed. This patient had 120 hours of therapy.
28. H.H.	M.	28	Psychosomatic	Relived disturbing Navy experience. Previous attempts at narcosynthesis were only partially successful.
29. W.F. (Out-Pt.)	M.	39	Psychoneurosis, Neurasthenia	Became more disturbed, but better able to discuss problems.

With L.S.D. 25, these eight patients had experiences which profoundly influenced the course of their progress. The effect was in the nature of a transitory toxic state, which disturbed the barrier of repression and permitted a re-examination of significant experiences of the past, which sometimes were relived with frightening realism. With this, some of the patients were then able to re-evaluate the emotional meaning of some of their symptoms, and improved. Most were better able to organize their ideas in relation to real rather than fancied problems and were seen to experience and express relevant emotion.

Two of the patients, 22 and 28, were improved sufficiently to discontinue treatment at the time of this writing.

Summary:

We believe that L.S.D. 25 is a drug which induces a controllable toxic state within the nervous system, that re-activates anxiety and fear with apparently just enough euphoria to permit recall of the provoking experiences. It does this without the sluggishness of speech difficulties so frequently encountered with amytal or the more marked confusion encountered during I.S.T. and following E.C.T.

On the basis of this preliminary investigation, L.S.D. 25 may offer a means for more readily gaining access to the chronically withdrawn patients. It may also serve as a new tool for shortening psychotherapy. We hope further investigation justifies our present impression.

Author's Note: Supplies of L.S.D. 25 for this study were made available by the manufacturer, Sandoz Pharmaceuticals, New York City.

REFERENCES

1. Helv. Chim. Acta 26, 944 (1943).
2. Schweiz. Arch. f. Neurol. u. Psych. (1947).

Social Factors in Health

HARRY ESTILL MOORE, PH.D.
Austin, Texas

Incidence of disease and death display wide variations when broken down in terms of race, socio-economic classes, ethnic group membership, or occupational classifications. Overall mortality and morbidity figures may conceal more than they reveal, when accepted as descriptive of the state of health of a community, region or nation. In a Texas city some years ago the report of the health officer showed the average age at death of members of one ethnic group to be less than 15 years, of another approximately 60 years.

Certainly not all such differences can be explained in terms of biological or physiological natures of members of the same zoological species. The infant mortality rates among Negroes has dropped from 135 per 1,000 in 1920 to 61 in 1943, but is still much higher than that for the white population. Further infant mortality rates tend to rise as the size of the city decreases, save in the South where rural infant mortality is lower than urban rates for any size city.

Similarly, early in the history of the Negro in this country, it was believed by physicians that this race possessed an innate immunity to tuberculosis; later it was thought that this disease would eliminate Negroes within a few decades; now it appears that susceptibility to this disease is not a matter of racial character. Tuberculosis, ricketts and some other maladies are often referred to as "diseases of poverty," expressing our belief that economic status is the dominant factor in their etiology. Hence, it would appear that disease *is* a respector of persons and shows a considerable degree of discrimination when he goes calling.

This opens the way to a discussion of some of the social factors in health. A recent work by a British physician has much to say of "sick societies."[1] This may sound like a mystical idea, and perhaps it is. But it is a matter of common observation that communities are often affected more or less seriously by some form of morbidity. Location may expose the persons living in a community to malaria by virtue of nearby swamps improperly safeguarded. And further, the whole life of the community is affected by the health of these ill members much as the life of an organism is affected by infection of some of its parts. Other cities take on much of their "personality" as health resorts. In Texas, San Angelo, El Paso, Mineral Wells or Marlin might be cited. In such cities the tempo of life and the institutions are modified to meet the needs of the ill. In one of these cities no public library was permitted for many years for fear of spreading tubercular infection. In the same city many of the workers are on part-time basis because of their physical weakness and this in turn requires unusual personnel management policies.

Impact of illness on the family is also a matter of common observation, though it has not received the study its importance would seem to demand. Because of illness of one member a family may find it necessary to change its location from one town to another to take advantage of aid from friends or relatives. In any chronic illness the economic problem is likely to become acute. Housing requirements may need to be revised. A shift of occupation is often necessitated even after complete recovery.

More subtle effects are also to be observed. The family life may revolve around the ill member. Often a family tyrant has a bed as his throne. A protective aura is thrown about the ill person which not only changes his personality, but also changes those of the other family members and creates an entirely new set of family relationships. The whole family may suffer chronic anxiety. Unless techniques are developed to meet the situation and attitudinal changes are accomplished so that illness is accepted, the strain may lead to family disintegration.

On the level of the person, disease or the

1 Halliday, J. W.: "Psychosocial Medicine," New York: *W. W. Norton & Co.*, 1948.

appearance of illness, may perform various functions. It is always appropriate, I take it, to ask, "What is done by this phenomenon." Fever may "burn out" an infection. So, "rheumatism" may give the sufferer a dominant status in his family; or may serve as an escape hatch from frustration by taking the ill person out of competition with those he fears. No one expects a sick person to assume responsibilities; and if responsibilities become too heavy one way of escape is through development of illness. That is, poor health may be, and sometimes is, used to gain or to maintain a preferred status. But again, the function of a given disease will vary from class to class, ethnic group to ethnic group, community to community, within limits, since the status awarded is gauged in terms of the ideas prevalent concerning the particular type of illness much more than on the physical effects of the illness.

For some time we have recognized psychosomatic illnesses as a genuine and baffling field of study. It seems to be no longer doubted that there are many persons who display a wide variety of symptoms and who suffer severely without there being any ascertainable biological or physiological basis for such behavior. Such illness cannot be explained satisfactorily without bringing in the emotional factor. But it is also well recognized that the emotion one feels and displays is often the result of social conditioning. Hence it is suggested that we need the concept of sociosomatic illness to enable us to diagnose and treat some of these baffling diseases.

This certainly is not to argue that there is no connection between physical and sociosomatic illness. Symptoms of pain or other distress may be entirely real and easily observable. Further, the two seem often to feed upon each other. For example, a student with poor vision, perhaps congenital, may earn poor grades as an effect. The poor grades may induce worry because of failure to meet family or community expectations. The worry may induce lowered vitality, which in turn may open the road to infection or to neurotic conditions of various sorts. In such a situation it is most difficult to classify the cause of the illness as either biological or social or psychological.

Similarly, if 50,000 persons watch a football game and one of that number faints from excitement while the others show no unusual reaction it clearly is not the football game which is to be held responsible for the fainting. The spectator may have fainted because of poor physical condition; or he may have fainted because football is far more important to him than to the others. If the second is the true explanation, we are faced with the question as to why it is so. The answer, it would seem, must be in terms of the social background of that person.

Medical records often are replete with all sorts of information which is of little value in diagnosing cases of sociosomatic illness. The emotional upsets through which the patient has passed may be of much greater importance in understanding his present condition than a history of the childhood diseases he has had. Bereavement, domestic difficulties, love affairs, thwarted ambitions, along with social class and group membership are factors in diagnosis into which we have just begun to delve.

But these things are social. They take on their importance precisely because of that fact, since psychosomatic and sociosomatic illnesses indicate an unhealthy social environment. We are infected with one type of disease in much the same way as we are the other; though the transmitting agency is different. What we need is not so much a healthy mind in a healthy body as a healthy person in a healthy community.

Halliday, in the work previously cited, points out that as physical or biological illnesses have declined in their incidence, psycho- and sociosomatic illnesses have risen. General mortality, infant mortality, congenital abnormalities, typhoid, tuberculosis, ricketts, rheumatic fever show steadily declining rates. But infertility, impotence, alcoholism, rheumatism, stomach ulcers, goiter, diabetes, paranoia, hysteria, hypertensive and cardiovascular diseases display rising rates. The conditions mentioned as showing rising rates are often associated

with social maladjustment and emotional stress.

If these illnesses are resultants of social conditions, the question arises whether or not they must be treated or prevented by social action. If it is possible to limit or eliminate malaria by changing the geographic environment, is it also possible to limit or eliminate alcoholism by changing the social environment? Certainly the major attempts we have made in this direction were unsuccessful, but so were many attempts to eliminate malaria before the technique of destroying the breeding places of the carrier mosquitoes was developed. Or, through appropriate psychiatric techniques may it be possible to immunize persons against psycho- and sociosomatic diseases by developing a state of mental health which will afford no receptive ground for neurotic ideas?

Clearly we are not now prepared to accomplish these things as effectively as we might wish. But clearly also we have begun thinking in this direction and experimenting with techniques which are proving successful to a marked degree. On the purely social level, for example, Alcoholics Anonymous appears to be efficacious in relieving the symptoms in a large number of cases of chronic alcoholism. Such success, plus confidence in our inventive ability, lead to the hope that we may become more effective in treating other conditions by social therapy.

Actually we have met with success in another area which might form a further basis for hope. We have reduced tuberculosis rates through housing programs. Then may we expect our social welfare programs, social security and like efforts to reduce sociosomatic illnesses through treatment of the social environmental conditions in which they thrive? Typhoid has been reduced by regulation of food handlers. Could we reduce suicide by providing better familial and community situations?

It is not the purpose of this discussion to imply that social and biological illnesses are the same. Certainly they are not. But it is suggested that we may get ideas for techniques from one field for trial in the other. It is further suggested that one type of illness cannot be thoroughly understood, or treated, without recognition of the other in terms of etiology, treatment and prevention.

This leads finally, to an attempt to define health in social terms. Franklin H. Giddings once argued that an action is to be called "ill" if it harms the person physically, psychically, or socially. We might substitute the word "unhealthy" for "ill" in the preceding sentence.

Physical health would be defined, I suppose, as the absence of infection or crippling handicap of a biological sort. But in spite of handicap and infection many persons manage to function normally in their social and psychic life; using their limited physical resources to the best possible advantage; and often more skillfully than most "healthy" persons.

Then, perhaps, a person may be considered healthy in the social sense when he uses the resources at his command in a manner to meet adequately the demands he faces; when he is emotionally stable, mentally alert, and has attained a satisfactory social adjustment with his fellows. Similarly a community might be considered healthy, from the social point of view, when there is an absence of conditions which promote physical illness, emotional upset, and social malfunctioning.

Setting up and maintaining such a community is, I take it, one of the primary goals of workers in the field of health and social welfare.

Neurological Clinical Pathological Conference

of the

Cincinnati General Hospital

CHARLES D. ARING, M.D., *Editor*

Case No. CH A-61321

Presentation

An unmarried woman of 34 years was admitted to a private hospital on August 30, 1949 in a debilitated state. She complained of diffuse cramping abdominal pain, constipation, twitching of all extremities, sleeplessness and frequent weeping. She had been considered by her mother to have been ill for most of her life. She had been seriously ill since August 1948 when she began to have abdominal pain, constipation and attacks of weakness of all extremities. She had been admitted to a hospital in another city and given insulin shock treatment because she was believed to be suffering from schizophrenia. She failed to improve. She lost weight and complained of the intolerance and brutality of her medical attendants. During the next eleven months, she was incapacitated from work (commercial art) most of the time, and had numerous medical and surgical examinations. Finally in July 1949 she had an exploratory laparotomy because she was believed to have endometriosis. Nothing abnormal was found. Following this operation she was deeply disturbed and emotionally unmanageable. She was returned to the hospital on August 30, a month after discharge, for psychiatric care with a tentative diagnosis of conversion hysteria.

The patient was closely attended by her mother who was querulous, antagonistic and interfering. She insisted on giving her daughter several enemas a day (even in the hospital). She combed her daughter's hair and massaged her skin for hours. She flooded the doctors with her own diagnoses and complaints about previous physicians. The patient herself was emaciated and weak. There were bizarre twitchings of all extremities. She talked rather dramatically in a low whisper, complaining that she could not give a history because of her discomfort. Following a brief physical examination, she was given a total of 1.3 gm. of sodium amytal to produce continuous sleep for 24 hours. The mother was separated forcibly from her, and further history and examination were deferred.

The story of the illness was obtained at intervals during the hospital stay. The patient was the youngest of three children, the only daughter of a disturbed and unhappy marriage which ended in divorce when the patient was six years old. She had developed a classically hysterical neurotic attitude toward life, work, family and sexual adjustment. Details of psychiatric history do not appear to be pertinent; they were entirely consistent with the diagnosis of a severe neurosis.

The mother felt that the patient did not "move normally" before birth; she insisted the birth was precipitate at exactly ten months. The child's fingers and toes "could not be separated"; she jerked violently at any touch, and at one year of age was felt to have "weak ankles." At ten years of age she began to have jerking of the head and shoulders when going to sleep. A diagnosis of St. Vitus' Dance was entertained at 12 years of age. The mother became furious when psychiatric consultation was called and the child questioned about her pubertal development which was delayed, the menarche occurring at fourteen years. During adolescence she had several acute attacks of pain in the abdomen and flank; at one time an operation was advised for "twisted ureter." She continued to be intermittently ill, and had the first of three laparotomies at the age of twenty-one, for "chronic appendicitis"; subsequently she was operated for "lysis of adhesions." Despite frequent attacks of abdominal pain, constipation, emotional instability, and anorexia with weight loss, she graduated from college second in her class and went into commercial art work. She lost much time because of illness. She had attacks of apparent collapse with generalized flaccidity. She continued a close but ambivalent relationship with her very domineering mother. She apparently had had no contacts with men.

In early September 1949 the patient was well-developed but emaciated. She appeared to be acutely and chronically ill. The skin was sallow. The heart rate was 120 per minute; the rectal temperature was 102 degrees F. on admission, but within normal limits after the second day. Blood pressure was 115/70. The abdomen was generally and deeply tender, and there were no palpable organs or masses. Examination of the cranial nerves, reflexes, and sensation was normal. She complained of numbness and paresthesias of all extremities. She was generally weak.

The red blood cell count was 3.3 million; hemoglobin 10.5 gm; the white blood count was 8,300 with 91 per cent polymorphonuclear leukocytes. Sedimentation rate was 18 mm. per hour. The urine was yellow, amber, and brown on three occasions; the specific gravity 1.007-1.025; tests for albumin and sugar were normal; microscopic examination was normal. Blood urea nitrogen was 7 mg. per cent. The red blood count and hemoglobin reached 4.67 million and 15 gm. on October 14, 1949 for no apparent reason. X-ray of the chest was within normal limits.

Treatment was varied and intense. Because of fever and respiratory discomfort, she was given a total of 2,800,000 units of penicillin during the first seven days in the hospital. She received frequent

small doses of paraldehyde, and on some occasions responded favorably to injections of sterile water for generalized pain and restlessness. Despite repeated attempts at improvement of her condition by psychotherapy (including pentothal interview, daily sessions with discussion of her emotional problems, intensive nursing care and forced feeding) she did not improve. She was placed on "tonic" doses of insulin before meals and then on subshock insulin alternating with electroshock. She received eight electroshock treatments beginning September 17, 1949. In the course of these she became progressively weaker and showed diminished convulsive response to the electroshock stimulus. She was given prostigmine orally in doses of 10 to 15 mg. three times daily after September 30, 1949.

By October 8, 1949 she had developed flaccid quadriplegia with complete loss of reflexes. There was absolutely no resistance to passive movements of the limbs. Large twitching movements of the limbs and trunk continued to be observed. There was bilateral facial weakness. She complained of numbness of all extremities. There was diminished appreciation of touch and pain of glove and stocking type in the extremities. The cerebrospinal fluid was normal.

The patient's course was downhill. She developed respiratory difficulty with rapid shallow breathing and intermittent cyanosis due to tracheobronchial mucus. She was briefly delirious at times, disoriented for time, place and person, and appearing to react to auditory and visual hallucinations. On occasion she showed surprising muscular power, drawing up her legs with abdominal pain, and also clutching with her fingers. She had several generalized attacks which appeared to be convulsive in nature. Treatment with nasal oxygen, pharyngeal suction, and aminophylline proved ineffective; she developed respiratory failure and died on October 15, 1949.

Differential Diagnosis

Dr. Richard W. Vilter: The case to be discussed today poses a most interesting problem combining neurology, psychiatry and metabolism. I believe this patient had a very rare disease, acute intermittent porphyria, and I shall try to differentiate this disease from the other psychiatric, neurologic and metabolic disorders that are suggested by the story.

She was a 34-year-old woman, who had been ill most of her life. She had a neurotic background, the protocol stating that there was incontrovertible evidence for such neurosis. I believe this must be taken at face value. Upon this background has been superimposed the other manifestations that must be discussed and interpreted. In the first place she had had many episodes of abdominal pain, which apparently began in puberty and which led to many exploratory operations. I think that in interpreting this pain, we can immediately eliminate the various surgical abnormalities that might induce such pain because none of them were ever found and she was explored more than sufficiently. Furthermore she never had any of the signs of a surgical abdomen, that is rebound tenderness, elevated white count, localized pain. I would guess from the descriptions that some motor abnormality in her gut was responsible for the pains.

The second group of symptoms that she seems to have had were attacks of collapse associated with generalized flaccidity, which came on at intervals and which disappeared rapidly. The third train of symptoms are strictly neurological. Numbness and tingling in the extremities and weakness, which finally progressed to a flaccid paralysis of all four extremities, seventh nerve involvement, disorientation, confusion, convulsions, psychic disturbances, coma, and finally death due to respiratory muscle failure.

To sum all this up, she was a girl with a neurotic background upon which there were superimposed symptoms and signs of abdominal pain, neuritis, encephalopathy, and finally death due to disease of a respiratory nature.

What are the diagnostic possibilities? One of the first is schizophrenia; and I think that from the record, it is obvious that a great many of the clinicians who saw her had this impression. I think we can eliminate this possibility. In the first place, an internist is discussing the case, an obvious reason why she shouldn't have schizophrenia. In the second place, there would be little to demonstrate pathologically. In the third place, the therapeutic attempts at relieving her psychic disturbances resulted in failure and fourthly and most importantly, the stereotyped pattern of her psychic disturbances and of her physical symptoms and signs and other complaints just do not fit with a diagnosis of schizophrenia. I have never seen a patient with schizophrenia alone who has died in the manner that this patient died, with neurologic abnormalities of a peripheral neuritic type, paraplegia and

death. I should say, however, that patients with schizophrenia can have many somatic complaints, among which may be abdominal pain. Terminally, patients with schizophrenia may develop high fever, coma, apparent paralysis and other somatic abnormalities, which confuse the diagnosis, but I've never seen a patient with schizophrenia who went through a pattern of this type.

A second psychiatric problem that might be brought up is conversion hysteria. I think most of the reasons why I say schizophrenia is unlikely also apply to hysteria.

Let's turn now to the neurologic possibilities. One of the first that came to my mind was Guillain-Barre syndrome, termed synonymously infectious polyneuritis, or polyneuritis with facial diplegia. Actually the name of the syndrome might raise the possibility because here was a patient who had a facial diplegia, who had neuritis, but there are many reasons why this diagnosis cannot be made. Even though Guillain-Barre syndrome can go into a chronic phase and incapacitate a patient for long periods of time, it never has the rapid ups and downs that this patient experienced. The spotty neurological abnormalities that were found do not occur very frequently in Guillain-Barre syndrome, and finally the cerebrospinal fluid examination eliminates the diagnosis. The absence of elevated protein in the cerebrospinal fluid—usually in Guillain-Barre syndrome it is very high—in itself eliminates that possibility. The same may be said for other types of neuritis—post diphtheritic neuritis, the neuritis and encephalomyelitis, which may follow various injections such as rabies vaccine and tetanus anti-toxin. There is no supporting historical data, and the progression of events is completely out of line.

One might also consider whether this patient had rheumatic encephalomyelitis because at one time she was suspected of having chorea as a child, and rheumatic fever can induce attacks of bizarre abdominal pain. The course taken by this disease, the manner in which the patient died, and the absence of other rheumatic manifestations do not support this possibility.

Other neurologic abnormalities can be eliminated in the same rapid fashion—progressive muscular atrophy because of the rapid remissions and exacerbations and the sensory abnormalities; myasthenia gravis, which I presume was entertained as a diagnosis since the patient was given prostigmine, can be eliminated by the failure of this therapeutic test and the absence of a very typical sign of myasthenia gravis, progressive weakness with activity. I might point out, however, one fact which is worth remembering. Prostigmine administered to a patient like this might have accentuated paralysis since this drug tends to relax muscles whose myoneural junctions are normal. This, of course, is an effect exactly opposite to that which occurs in the muscles of persons with myasthenia gravis.

Other abnormalities which fall somewhere between medicine and neurology should receive some consideration. Various vitamin deficiencies of very severe degree might produce peripheral neuritis, abdominal pain, psychic abnormalities, and might eventually lead to death though not, at least in my experience, in respiratory paralysis. These can be ruled out because there are no other evidences of vitamin deficiency, and this patient was neither an alcoholic nor do we have a good history of an inadequate diet in the past. The same thing can be said for combined system disease, which also might come up for superficial consideration. The lack of ataxia and the lack of any severe cord signs, when there was such severe flaccid quadriplegia, eliminate that diagnosis. One thing which is a bit more difficult to eliminate is lead poisoning which produces peripheral neuritis, encephalopathy, colic abdominal cramps and constipation. However, I have never seen neuritis of such severity in lead poisoning that respiratory muscles are effected. Furthermore there was no history of lead ingestion; no stippled cells, no anemia; and if this were lead encephalopathy, the spinal fluid pressure should have been elevated. Arsenic poisoning might also come up for consideration, but usually patients with chronic arsenic poisoning have diarrhea rather than constipation, their skin is pigmented; they have an exfoliative type of dermatitis as well as peripheral neuritis. Their terminal course is not that of this patient.

Several interesting metabolic abnormalities must be considered. Because of the attacks of flaccid paralysis which came and went, one thinks of familial periodic paralysis, a rare abnormality of potassium metabolism. This is a familial disease, and the paralysis can be relieved by administering potassium. I cannot explain the abdominal cramps and constipation of this patient by such a metabolic anomaly. Nor do these patients die of respiratory paralysis.

Finally after exhausting all other possibilities, I am left with the condition which I have already indicated I think best explains this patient's illness, acute intermittent porphyria. This disease occurs because of an abnormality of porphyrin metabolism, which is hereditary and may produce clinical disease or be dormant as a trait which may be transmitted to offspring.

Why does acute intermittent porphyria fit so well? In the first place abdominal pain of a diffuse variety without muscle spasm, without rebound tenderness and without localization and with constipation over a number of years are the most common complaints of this disease. The prognosis when the abdominal manifestations are present alone is rather good. Twenty-five or more years of life is not too long for patients with porphyria who have just the abdominal complaints. These complaints usually put in their appearance at about puberty, which one finds happened in this patient. She began to have her attacks of pain during adolescence, and that is when her operations began. These patients are frequently operated on multiple times in search of surgical abnormalities that are never found. Although I could not find any definite statement in the literature concerning the mechanism of this pain, it seems to me from the descriptions that it is either an abnormality of nerve or muscle function in the gut, since these are the two systems which are primarily involved in acute porphyria.

This patient also had the involvement of the central and peripheral nervous system, including the psychic abnormalities such as occur in the classical descriptions of this disease. I do not say that all of this patient's psychic abnormalities were due to porphyria; I doubt it very much. I believe she had plenty of neurotic traits, a neurotic life pattern, which could explain them. I think the severity, however, of the psychic abnormalities was increased by the porphyria, although the pattern that they took was probably predetermined by her background. In acute porphyria pain in the muscles may occur similar to the type one sees in diabetic neuritis. Peripheral neuritis is one of the most common manifestation, contractures occur as muscle atrophy progresses and the patient eventually may develop quadriplegia as this patient did; the cranial nerves may be involved, particularly the seventh, convulsions occur, and usually these patients die of a respiratory paralytic death. Many of them have died in respirators. In addition patients with intermittent porphyria have other manifestations many of which this patient didn't have, but they are all minor and I don't believe their absence mitigates against this diagnosis. Many have excessive pigmentation of the skin or vitiligo. Pigmentation may be of such an extent as to suggest Addison's disease or hepatic cirrhosis. Hypertension during an attack is common, and there may be abnormalities in the eye grounds such as vasospastic phenomena. Albuminuria may occur during an attack; fever and tachycardia are not uncommon. Although the prognosis is rather poor when the neuritic form of the disease appears—usually two or three years—there is still a possibility of spontaneous remission with complete disappearance of all symptoms except, of course, the muscle contractures. Relapse may occur and finally lead to death. The prognosis is poor after neuritic symptoms appear, but fairly good if abdominal pain is the only manifestation of the disease.

How does the physician make the diagnosis of this disease? He must suspect it from the history and clinical features and then go to the laboratory for confirmation. He doesn't make the diagnosis by looking at a urine specimen and finding it red and dark brown; nor by getting a history of red urine. These color changes may not occur. More frequently than not, one will have a normal colored urine as it is voided. One can stand such urine in the light and see it darken, which might conceivably lead to the

diagnosis, or one can do an Ehrlich's aldehyde test for porphyrobilinogen and find the red porphyrobilinogen aldehyde, which unlike the urobilinogen aldehyde is insoluble in chloroform. These two tests are the easy ones which can be done. If one has a spectrophotometer, one can determine whether the absorption bands for porphyrin are present or not in the urine. The spectroscopic test for porphyrin is specific. The porphyrin found in the urine of this patient was probably uroporphyrin type III, though some coproporphyrins and uroporphyrin type I may also have been present. In most cases of acute porphyria studied, the type III uroporphyrin has been found; whereas in the congenital or photosensitive type of porphyria, uroporphyrin type I predominates.

I believe this patient had acute intermittent porphyria, that she died with peripheral neuritis, encephalopathy and finally respiratory paralysis.

Dr. Charles D. Aring: Numerous physicians in several cities saw this patient and made about as many clinical diagnoses. However, those we have been able to contact all agree now that she had porphyria. Some of the data gathered from some of these physicians after the patient's death indicates that there was abnormally colored urine as far back as 1947. These specimens according to the records were intermittently green-black, amber, and red-yellow. In the final week of the patient's life, one physician thought of the diagnosis of porphyria. Urinalysis was done and porphobilinogen was found.

Pathological Discussion

Dr. Murton Shaver: The autopsy in this case was performed in another hospital, and their description of the appearance at death was that the skin showed a slight yellow tinge generally. The body was somewhat emaciated. The viscera generally showed some congestion, and there was some edema of the lungs.

The brain was normal in appearance aside from some hyperemia with congestion of the superficial vessels. Blocks of tissue were removed for microscopic examination from the cerebral cortex, caudate nucleus, thalamus, hypothalamus, pons, dentate nucleus, cerebellum, medulla and upper spinal cord. These were stained with hematoxylin and eosin, phosphotungstic acid-hematoxylin, cresyl-violet, and with the Loyez method for myelin sheaths, and Bielschowsky's method for neurofibrils. Additional sections were stained for iron using Turnbull's stain, while Fontana's method was used for melanin, and a few sections were stained for fat using Sudan IV.

Over the cerebral cortex, the leptomeninges showed generalized slight fibrous thickening, and small accumulations of fine brick-red to brown granules were scattered through this tissue, much of it being collected in endothelial cells, particularly in and around the medium sized and smaller vessels. Similar accumulations of pigment were found around many of the cortical vessels; which showed varying moderate degrees of cellular or fibrous thickening of their walls. No inflammatory cell infiltration was observed.

The cytoarchitecture was well preserved generally except for patchy perivascular areas where there was nerve cell loss with acute swelling and chromatolysis of the remaining cells. In many of these cells the nucleus was displaced by dark, finely granular pigment, while in some cases a yellow lipoid material was also found within these cells. This stained faintly with Sudan IV.

Small areas of rarefaction were found around a few of the medium sized vessels. Generally the neurofibrils were well preserved; and in these areas only some swelling of the fibers was apparent. The oligodendroglia generally were increased in number, but only moderately swollen. A few appeared to be encrusted with fine dark brown pigment granules. One could not be certain whether this was intra- or extracellular.

In sections through the basal ganglia and hypothalamus focal perivascular areas of acute and severe nerve cell change, with intracellular pigment and lipoid granules, similar to those described in the cortex were observed. The oligodendroglia again were increased in number but only slightly swollen. Slight endothelial proliferation was observed in some of the vessels, and a few contained reddish, or dark brown pigment

granules. Again, no inflammatory cells were present. Perivascular changes were rarely seen with slight swelling of the myelin sheaths and neurofibrils.

Sections through the cerebellum, and dentate nucleus, revealed little evidence of endothelial hyperplasia of the blood vessels, and only occasional cells in the leptomeninges and parenchyma contained the brownish pigment granules described. The most change was in Purkinje cells, which showed swelling and distortion; the cytoplasm had a hyaline appearance and there was loss of nuclei and intracellular structure in many cases. A large number of these cells were completely lost. Similar but less severe change was observed in the dentate nucleus, many of these cells containing the fine dark brownish pigment described above. The white matter generally was preserved; while the ependymal cells lining the 4th ventricle generally showed swelling but contained no pigment.

Sections from pons and medulla showed moderate accumulations of pigment in endothelial cells around and in the leptomeningeal and parenchymal vessels; while in sections of the cervical and upper dorsal spinal cord there was marked thickening of the leptomeninges with collections of brick red pigment in endothelial cells, and also free between the fibers of the meninges and in the spinal roots.

Nerve cell changes in focal areas were found in the pons and medulla, similar to those described in the cerebral cortex. Many cells showed only moderate swelling. In the spinal cord the nerve cells of the anterior and lateral horn groups were markedly diminished in number. Those remaining in some cases presented a hyaline swollen appearance similar to the Purkinje cells, while others were shrunken, distorted, and sclerotic.

In these levels there was no apparent increase in oligodendroglia, and in general they may have been diminished in number. The white matter of the brain stem and spinal cord showed generalized swelling of the myelin sheaths, with wide separation of these structures as is found in edema. While the neurofibrils showed some swelling they were preserved generally. In some of the spinal roots there appeared to be a diffuse increase in collagen and there was diffuse loss of myelin sheaths although with neurofibrillar stains, the axones generally appeared to be better preserved.

The dorsal root ganglia and attached nerve roots showed a severe degree of degeneration of the myelin sheaths and isolated clumps of histocytes containing fat. The ganglion cells showed hyalinization, with loss of nuclei and Nissl substance in many cases. Some were completely degenerated.

Section through the celiac ganglion showed changes similar to those already described; in one section there was an infiltration of lymphocytes. This has been reported in a few cases but has not been found diffusely through the central nervous system. Section through the cauda equina showed changes similar to those found elsewhere in nerve roots. Degeneration and gitter cell infiltration were found in these nerves.

Although we have no other sections of peripheral nerves, the tissue that we do have shows typical peripheral neuropathy, an ascending myelopathy, and a mild degree of encephalopathy. The pigment suggests that this is a case of porphyria and this is corroborated by the finding of porphyrins in the urine. The only unusual finding is the pigmentation in the leptomeninges of the spinal cord.

Clinical Diagnosis
Acute intermittent porphyria.

Dr. Vilter's Diagnosis
Acute intermittent porphyria.

Anatomical Diagnosis
Encephalomyeloneuropathy.

Student: Is there an acquired porphyria, or must one have a predisposition to develop it?

Dr. Vilter: There is an acquired porphyria, but it is a symptomatic affair due to the ingestion of sulphonal, which was a drug used as a hypnotic before the barbiturates came into vogue. Fifteen or twenty years ago, there were a lot of cases of porphyrinuria due to sulphonal ingestion, which ceased upon elimination of this drug. Actually this particular disease is not produced by any known drug.

Student: I would like to know if there is any correlation between the amount of production or excretion of porphyrin and the clinical manifestations?

Dr. Vilter: There is a general relationship but not a perfect one. In other words, with the onset of acute abdominal pain, there is more likelihood of a larger excretion of uroporphyrin in the urine than during the periods of remission. Even during remissions, these patients put out very large quantities of porphyrin. There is an upsurge, however, with the acute attack.

Student: You mentioned, Dr. Vilter, that prostigmine had adverse effects on patients like this. Did you mean this is generally so?

Dr. Vilter: I meant that it may have an adverse effect upon people who have bulbar palsy not due to myasthenia gravis. What would you say, Dr. Aring?

Dr. Aring: I agree. Prostigmine does something to the myasthenic muscle that it does not do to the normal muscle or to muscles suffering other disease. It causes them to fasciculate; in myasthenia gravis prostigmine will not usually cause fasciculation. One of the points that you must look for when you're using this substance diagnostically is muscle fasciculation. If it occurs, the disease is not apt to be myasthenia gravis. Perhaps the fasciculating muscle is not as efficient as the non-fasciculating muscle; in any case persons with bulbar palsy due to conditions other than myasthenia gravis don't tolerate well whatever it is that prostigmine does.

Student: What about the shock therapy?

Dr. Aring: I don't think it did her any good. The flaccid paralysis followed directly on shock. Previous to that she had been receiving rather large doses of amytal. Patients with porphyria almost universally have received large doses of barbiturates prior to the manifestation of devastating signs. I suppose the same might be said of many persons who are very ill.

Dr. Daniel Osher: Is anything known about the enzyme system involved here, especially in regard to the possible therapy of this disorder?

Dr. Vilter: Nothing is known whatsoever. The presumption is that there are abnormal enzymes symptoms, and attempts at therapy have been made by giving intravenous liver extract for what coenzymes and coenzyme precursors it may contain. I believe it was Dobriner who thought he had benefited patients by liver extract, but if you will recall the history of many diseases over the past fifteen years, many others have been thought to have been so benefited, and as time goes on one finds that they are not benefited at all. Nobody else has been able to produce such benefit. Watson states that he has never seen any beneficial effect from anything. These patients may go into a remission spontaneously if they receive good nursing care and do not have a lot of medication. They may be helped or benefited temporarily when they have a lot of abdominal colic by the administration of calcium, but as far as I can tell, that's the only thing that is of symptomatic benefit. The barbiturates should be avoided because they may make the disease worse. Demerol is said to be one of the best analgesic drugs for use in this disease.

Student: Has this disease been reported in males?

Dr. Vilter: Yes, but it is twice as frequent in females.

OBITUARY

GLENN MYERS 1886-1950

Dr. Myers, associate editor of *Diseases of the Nervous System,* was born in Attica, Ohio, in 1886 and died June 11, 1950. Following preliminary education, he attended Buchtel College receiving his A.B. in 1907 and M.D. in 1909 from the University of Indiana.

In 1910, after internship, he entered the field of psychiatry and until 1918 held capacities in several institutions, including the Eastern Indiana State Hospital, the Manhattan State Hospital at Ward's Island and the Agnew State Hospital in California. After two years in service he was discharged as captain in 1919.

Dr. Myers was one of the founders of this journal and has been an associate editor since its inception in 1940.

Since 1919, he has been Medical Director of Compton Sanitarium. He was a member of the American Psychiatric Association, of the Society for Research in Nervous and Mental Diseases and the National Committee for Mental Hygiene. He had been Chairman of the Executive Committee of the Council of Social Agencies and President of the Association of Western Hospitals.

Dr. Myers had served on the executive board of the Hospital Service of Southern California, as Vice-President and Trustee of the California Physicians Service and President of the Public Health League. He was Past President of the Los Angeles Society of Psychiatry and Neurology and Past Chairman of the section of Psychiatry and Neurology of the California Medical Association.

It is with regret that *Diseases of the Nervous System* announces the loss of this associate.

PINEL CLINIC
ELLICOTT CITY, MARYLAND
A Private Sanitarium for the Neuroses and Psychoses
IRVING J. TAYLOR, M.D.
Medical Director
DESCRIPTIVE FOLDER ON REQUEST

Sedation and Euphoria for Nervous, Irritable Patients

VALERIANETS-DISPERT®

Each tablet contains Ext. of Valerian 0.05 gm. dispergentized for maximum efficiency. Odorless and tasteless. Non-habituating. ACTION AND USES: A mild central nervous system depressent. For use in emotional upsets, anxiety states, nervous insomnia, the nervous syndrome of the menopause and of arteriosclerotic subjects.
1 or 2 tablets as required or 3 on retiring.
Bottles of 50, 100 & 500.
STANDARD PHARMACEUTICAL CO., INC. 1123 Broadway, New York